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ABSTRACT

A study examined the effectiveness of the Chapter 1 Corrective Reading Program, designed to provide supplementary reading and writing instruction to Chapter 1-eligible students from New York City nonpublic schools. During the 1988-89 school year, the program served a total of 7,943 students at 162 instructional sites. The total included 4,656 students receiving face-to-face instruction and 3,287 students receiving computer assisted instruction (CAI). In addition, 65 teachers, 780 parents, and 831 students participated in a new Parent Read-Aloud Program in grades one through three. Sources of data included program documents, data retrieval forms, observations of classes and staff development training workshops, interviews with program staff, and the results of standardized reading tests. Results indicated that students in all grades on all subtests in all modes of instruction achieved mean gains that were statistically significant and met the program criteria for success. Recommendations include: (1) vigorous promotion and expansion of the Parent Read-Aloud Program; (2) continuation of staff development as currently organized; (3) more training for CAI teachers on the content and features of software packages; (4) continuation of efforts to adapt software for use in settings where teachers are not physically present; and (5) evaluation of the CAI curriculum for first grade and, if necessary, change of the curriculum. (Fifteen tables of data are included; a brief description of Chapter 1 nonpublic school reimbursement services and the CAI teacher survey are attached.) (RS)

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OREA Report

EVALUATION SECTION REPORT

CHAPTER 1
CORRECTIVE READING PROGRAM
1988-89

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EVALUATION SECTION REPORT

John Schoener, Chief Administrator

May 1990

EVALUATION SECTION REPORT

CHAPTER 1
CORRECTIVE READING PROGRAM
1988-89

Prepared by
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CHAPTER 1 CLINICAL AND GUIDANCE PROGRAM
1988-89

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CHAPTER 1 CORRECTIVE READING PROGRAM
1988-89
EVALUATION SUMMARY*

THE CHAPTER 1 CORRECTIVE READING PROGRAM

The Corrective Reading program provided supplementary reading and writing instruction to Chapter 1-eligible students from New York City nonpublic schools. Program staff consisted of one coordinator, three field supervisors, and 80 program teachers. The goals of the program are to improve students' reading and writing skills, encourage them to read for pleasure, and increase their motivation for learning. During the 1988-89 school year, the program was funded at approximately $7.8 million.

On July 1, 1985, the Supreme Court ruled that instruction by public school staff on the premises of nonpublic schools was unconstitutional. Since the 1985-86 school year, students have received Chapter 1 services at public schools, leased neutral sites, mobile instruction units (M.I.U.s), and nondenominational schools. In 1987-88, Chapter 1 services were expanded to provide computer-assisted instruction (C.A.I.), in which teachers monitor student progress and provide instructional assistance via modems from a Board of Education administrative center. Thus, students from nonpublic schools are taught in one of three modes: face-to-face instruction; computer-assisted instruction (C.A.I.); or combination services, i.e., face-to-face instruction combined with C.A.I.

PROGRAM OBJECTIVE

Students were expected to make statistically significant mean gains from pretest to posttest on the standardized reading tests administered by the program.

EVALUATION METHODOLOGY

Program documents, data retrieval forms, observations of classes and staff development training workshops, interviews with program staff, and analyses of standardized reading tests were the sources for the evaluation of the program. The impact of the program on student achievement was determined by evaluating students' performance on the tests.

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*This summary is based on the Evaluation Section Report of the Chapter 1 Corrective Reading program, 1988-89, prepared by the OREA Instructional Support Evaluation Unit.

FINDINGS

Students Served

During the 1988-89 school year, the program served a total of 7,943 students at 162 instructional sites: 60 C.A.I. sites, 57 M.I.U.s, 32 public schools, 12 leased neutral sites, and one non-denominational site. The total included 4,656 students receiving face-to-face instruction and 3,287 students receiving C.A.I. More than two-thirds of the participants were in their first year of the program; one-fifth were in their second year; and less than one-tenth had participated for three or more years. In addition, the majority of C.A.I. students received C.A.I. by itself, while some 24 percent received combination services.

The Parent Read-Aloud Program

In 1988-89, the program introduced a Parent Read-Aloud program in grades one through three. The objectives were to enhance students appreciation of and interest in reading by exposing them to good literature at an early age and to involve parents in the education of their children. Teachers recruited parents, conducted parent-training workshops, and developed read-aloud kits containing parent-training materials, paperback books, school supplies, and exercises. In all, 65 teachers, 780 parents, and 831 students participated in the program.

Staff Development Training

Staff development training included formal conferences and regular outreach to program teachers by the program coordinator and the three field supervisors. Conference activities consisted primarily of lectures and demonstrations followed by whole or small group discussions. The principal areas of focus were the Parent Read-Aloud Program, reading through literature, and reading in content areas. Workshop participants were generally responsive and attentive, and teachers were satisfied with staff development training and felt they were successful in implementing the instructional methods presented at workshops.

Computer-Assisted Instruction

The software packages were originally designed for learning situations where a teacher was physically present while students worked at computers and had to be adapted to a situation where teachers were not physically present. Teachers received training from software companies, but the training task was made difficult by the fact that new schools were brought on-line throughout the year and teachers required many different levels of training. Moreover, teachers spent one to four days a week in the schools teaching the face-to-face mode of instruction and sometimes were

not present for C.A.I. training sessions at the administrative center.

Successful implementation of C.A.I. depends on the capacity of the software to respond to the needs of students and on the teacher's skill in guiding students through the curriculum. In order to develop the responsiveness of the software to the needs of students, program administrators and teachers must continue to work with company representatives to discover ways to revise the software and improve remediation. Ultimately, the availability and responsiveness of company representatives and the flexibility of instructional personnel will be critical to the successful implementation of the program.

A survey, designed to elicit teacher perceptions of the C.A.I. mode of instruction, was completed by all 38 C.A.I. teachers at the end of the school year. The majority of the teachers had ten or more years experience teaching in Chapter 1 programs. Two-thirds of them were in their second year of C.A.I. instruction; one-third were C.A.I. novices; and no teachers had any C.A.I. experience prior to their participation in the program.

Teaching assignments included C.A.I., combination services, and mixed assignments, i.e., teaching in both the C.A.I. and the face-to-face mode of instruction. Most teachers had mixed assignments. They also were responsible for teaching different grade levels, and 82 percent taught six or more different grade levels. Additional findings include:

- Teachers previewed only 18 to 24 percent of their lessons.
- Only 32 percent of the teachers used the initial placement test accompanying the software package.
- Communication with students could be improved.
- Reinforcement of basic skills component of the software needs to be improved.
- The software needs more branching.

Student Achievement

In general, students in all grades on all subtests in all modes of instruction achieved mean gains that were statistically significant and met the program criterion for success. Yet there were seven cases in which students did not achieve statistically significant mean gains by grade on a subtest. However, too much importance should not be placed on the failure of these students to achieve statistically significant mean gains: in all of these cases, the number of students taking the subtest was small--17

students or less--and it is more difficult for small groups to achieve mean gains that are statistically significant.

For example, C.A.I. students in first grade did not achieve statistically significant mean gains on the Aural Comprehension and the Letters and Sounds subtests of the SESAT. On the Aural Comprehension subtest, they achieved a mean gain of 3.9 N.C.E.s and on the Letters and Sounds subtest, their mean score decreased by 8.2 N.C.E.s from pretest to posttest. However, only 13 students took the Aural Comprehension subtest, and only 17 students took the Letters and Sounds subtest. Moreover, C.A.I. students in grade twelve on the Language Mechanics and Language Expression subtests of the CAT (14 students on each test) and face-to-face students in grades ten and twelve on the Language Mechanics subtest and grade ten on the Language Expression subtest of the CAT (13, 10, and 12 students respectively) did not achieve statistically significant mean gains.

RECOMMENDATIONS

- The Parent Read-Aloud program was successful in involving parents, and it should be vigorously promoted and expanded.

- Staff development training of face-to-face teachers introduced innovative pedagogical techniques. Teachers were satisfied with the training and felt they were successful in implementing the instructional methods presented at workshops. Staff development should continue as currently organized.

- C.A.I. teachers instruct students at many different grade levels and thus must become familiar with a variety of lesson plans. However, they devoted little time to previewing lessons. C.A.I. teachers should receive more training on the content and features of software packages.

- Successful implementation of C.A.I. rests in part on the teacher's skill in guiding students through the curriculum. C.A.I. trainers should adjust their schedules to accommodate teachers who spend several days per a week away from the administrative center teaching in the face-to-face mode of instruction.

- Efforts to adapt software for use in a setting where teachers are not physically present must continue. In order to monitor the capacity of the various software systems and companies to adapt to this learning situation, the companies should be evaluated for their responsiveness to teacher suggestions and requests.

- Program objectives were generally met by students in the face-to-face mode of instruction. Face-to-face classroom instruction should continue as currently organized.

- C.A.I. students in the first grade made small or negative mean gains on the Aural Comprehension and the Letters and Sounds subtests of the SESAT. The C.A.I. curriculum for first grade should be evaluated and, if necessary, changed.

ACKNOWLEDGEMENTS

The production of this report is the result of a collaborative effort of full-time staff and consultants. In addition to those whose names appear on the cover, Ilan Talmud analyzed the data on which this report is based, Yvonne Spoerri assisted in the production of tables and typed the final draft, and Stan Davis edited the final draft. This unit could not have produced this evaluation without their cooperation.

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I. INTRODUCTION

PROGRAM PURPOSE

The Corrective Reading program provides supplementary reading and writing instruction to Chapter 1-eligible students in New York City nonpublic schools. Students from participating nonpublic schools are taught in one of three modes: face-to-face instruction; computer-assisted instruction (C.A.I.); or combination services, i.e., face-to-face instruction combined with C.A.I. The primary goal of the program is to improve students' reading and writing skills. Other goals include encouraging students to read for pleasure and increasing their motivation for learning.

ELIGIBILITY

Students are eligible for Chapter 1 services if they live in a targeted attendance area and score below a designated cutoff point on State-mandated tests or standardized reading tests. Most nonpublic schools participating in Chapter 1 instructional programs use either the Scott-Foresman Test or the Comprehensive Test of Basic Skills (C.T.B.S) as their screening instrument.

Nonpublic school students must score at or below a specific grade equivalent to be eligible for Chapter 1 instructional programs. The grade equivalent is a calculation of the grade placement in years and months of students for whom a certain score is typical. It represents the level of work a student is capable of doing. However, a ninth grade student who achieves a test score that is 11.6 grade equivalents does not belong in the eleventh grade; rather, the 11.6 grade equivalent score indicates

that the student scored as well as a typical eleventh grade student would have scored on the ninth grade test. The designated cutoff point ranged from three months below grade level for students in first grade to two or more years below grade level for students in high school.

STUDENTS SERVED

In the 1988-89 school year, the Corrective Reading program served a total of 7,943 students at 162 instructional sites: 4,656 students received face-to-face only instruction, and 3,287 students received computer-assisted instruction or combination services. More than two-thirds of the participants (69 percent) were in the first year of the program; one-fifth were in their second year; and less than one-tenth had participated for three or more years. In addition, approximately three-fourths of the students were in grades two through six (see Table 1).

PROGRAM OBJECTIVES

The objective for the 1988-89 Corrective Reading program was:

- Students were expected to make statistically significant mean gains from pretest to posttest on the standardized reading tests administered by the program.

PROGRAM EVALUATION

The purpose of the 1988-89 evaluation by the Office of Research, Evaluation, and Assessment/Instructional Support Evaluation Unit (OREA/I.S.E.U.) was to describe the program and to assess its impact on student achievement. The following methods were used:

TABLE 1

Student Participation in the Corrective Reading Program by Grade and Number of Years in the Program, 1988-89

Grade	N[a]	%	Number of Years in the Program: 1 N	1 %	2 N	2 %	3 or more N	3 or more %
1	210	2.6	201	95.7	9	4.3[b]	0	0.0
2	1148	14.5	1019	88.8	125	10.9	4	0.3[c]
3	1329	16.7	910	68.5	370	27.8	49	3.7
4	1324	16.7	828	62.5	360	27.2	136	10.3
5	1169	14.7	680	58.2	274	23.4	215	18.4
6	1052	13.2	655	62.3	219	20.8	178	16.9
7	767	9.7	506	66.0	147	19.2	114	14.9
8	416	5.2	260	62.5	101	24.3	55	13.2
9	202	2.5	198	98.0	4	2.0	0	0.0
10	158	2.0	129	81.6	29	18.4	0	0.0
11	115	1.4	78	67.8	34	29.6	3	2.6
12	53	0.7	41	77.4	8	15.1	4	7.5
Total	7943	100%	5505	69.3%	1680	21.2%	758	9.5%

[a]Includes 4,656 students receiving face-to-face instruction and 3,287 students receiving computer-assisted instruction (C.A.I).

[b]Of the nine first grade students in their second year in the program, eight were held over and one was indeterminate.

[c]Of the four second grade students in their third year in the program, three were held over, and one was indeterminate.

- More than two-thirds of students were in their first year of the program.
- Approximately three-fourths of all Corrective Reading Program students were in grades two through six.

- analyses of data retrieval forms that report information about grade placement, number of years in the program, participation in other Chapter 1 programs, and referrals to the Clinical and Guidance program;
- interviews with program staff and review of documents describing program organization and funding, services provided, and staff development training;
- observations of classes and staff development conferences in order to gather qualitative data on the implementation of the program; and
- analyses of student scores on standardized reading tests.

SCOPE OF THE REPORT

The purpose of this report is to assess the implementation and effectiveness of the 1988-89 Chapter 1 Corrective Reading program. Program organization and implementation are described in Chapter II. The C.A.I. mode of instruction and the results of a survey of C.A.I. teachers are discussed in Chapter III. Student academic achievement is presented in Chapter IV. Conclusions and recommendations are offered in Chapter V. In addition, there are two appendices, a brief description of Chapter 1 Nonpublic School Reimbursable Services for 1988-89 and a copy of the C.A.I teacher survey.

II. PROGRAM ORGANIZATION AND IMPLEMENTATION

PROGRAM ORGANIZATION

Program Funding and Staff

During the 1988-89 school year, the Corrective Reading program was funded at approximately $7.8 million. Program staff consisted of one coordinator, three field supervisors, and 80 program teachers.

The Supreme Court Ruling and Program Organization since 1985

On July 1, 1985, the Supreme Court ruled that instruction or counseling by public school staff on the premises of nonpublic schools--local educational agencies' most common method to serve Chapter 1-eligible students from nonpublic schools--was unconstitutional. As a result, alternative means for providing Chapter 1 services were devised. Since the 1985-86 school year, eligible students attending nonpublic schools in New York City have received Chapter 1 services at public schools, leased neutral sites, mobile instruction units (M.I.U.s), and non-denominational schools.

Public school sites are designated classrooms in public schools; leased neutral sites are classrooms in public buildings such as community centers; mobile instructional units are mobile classrooms parked outside the school being served. Students are bused or otherwise escorted to the Chapter 1 site from their nonpublic schools.

In 1987-88, Chapter 1 services were expanded to provide remedial instruction to some nonpublic school students via

computer-assisted instruction (C.A.I.) C.A.I. sites are classrooms in nonpublic schools used exclusively for C.A.I. Chapter 1 teachers are not present at C.A.I. sites. Instead, they monitor student progress through the curriculum and provide instructional assistance via modems from a Board of Education administrative center. At the C.A.I. site, noninstructional technicians maintain and operate equipment and maintain order and safety. The computer hardware and software used by Chapter 1 students must be non-divertible so that it cannot be used in the nonpublic schools for anything other than Chapter 1 instruction.

Program Organization, 1988-89

Students are taken from and returned to their nonpublic schools. They received instruction at 57 M.I.U.s; 32 public schools; 12 leased neutral sites; and one nondenominational site. Teachers usually taught approximately ten instructional groups per week. Each group contained five to ten students. Classes were held from one to three times a week for 45 to 60 minutes. More than 86 percent of the students attended class at least twice a week.

Students suffering from social or emotional problems that might have impeded their academic performance were referred to the Chapter 1 Clinical and Guidance program.* During the 1988-89 school year, diagnostic and counseling services were provided to 3,405 Corrective Reading students.

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*For a brief description of Chapter 1 Services, see Appendix A.

PROGRAM IMPLEMENTATION

Site Observations

An OREA team visited a leased neutral site, a public school, and an M.I.U. and conducted a series of five classroom observations. One teacher was observed during four consecutive classes on a single day. Two additional teachers were observed for three class sessions each, on two separate occasions, approximately three months apart. Observations focused on the ways teachers employed the pedagogical techniques introduced in staff development training conferences. In addition, the three teachers were interviewed to discover their perceptions of the staff development training program.

Classroom Environments

Classrooms contained instructional materials such as storybooks, textbooks, magazines, workbooks, arts and crafts materials, and commercial and language games. In addition, classrooms walls were covered with student- and teacher-made displays reflecting past and ongoing lessons.

Curriculum

The curriculum varied according to grade level. In grade one, emphasis was placed on language concepts, vocabulary development, letter recognition, sound-symbol relationships, and auditory discrimination. In grades two through eight, language concepts, word recognition, comprehension skills, and the application of reading skills to subject areas were stressed. At

the secondary school level, curricula focused on the comprehensive development of reading and writing skills.

In the observed classes, reading skills, vocabulary development, and an appreciation of literature were taught in grades two through four by introducing students to poetry. In grades five through eight, students' critical and creative thinking abilities were enhanced with a comprehensive approach to reading and writing skills. In general, students were very responsive to the instructional methods employed by teachers and participated enthusiastically in classroom discussions. They were particularly animated when asked to read aloud or act out various passages from the readings.

Reading at Home

Students were encouraged to bring home library books to supplement and reinforce classroom reading instruction. Data were collected on the number of library books taken home by students receiving face-to-face instruction and means were calculated for each grade. Data was collected on all students who took home at least one library book during the school year, 4,084 of 4,656 students (88 percent). Table 2 shows that:

- In the grades one through three, the mean number of books taken home ranged from 20.1 to 22.3.
- In grades four through eight, the mean number of books ranged from 9.8 to 18.0.
- In grades nine through twelve, the mean number of books ranged from 2.3 to 5.8.

Pearson correlations were then calculated to determine whether there was a relationship between the number of library

TABLE 2

Mean Number of Library Books Taken Home
by Face-to-Face Students
in the Corrective Reading Program by Grade, 1988-89

Grade	N	Mean Number of Books[a]
1	148	20.9
2	725	23.3
3	749	20.1
4	735	18.0
5	609	15.4
6	505	12.5
7	387	11.2
8	151	9.8
9	28	5.8
10	18	2.7
11	15	1.2
12	14	2.3
Total	4084	17.1

[a] Pearson correlations between the number of library books taken home and achievement test score gains ranged from .06 (Language Expression) to .13 (Reading Comprehension). Although these relationships were statistically significant ($p \leq .05$), they were very small.

- In the first through third grades, the mean number of books taken home ranged from 20.1 to 22.3.
- In grades four through eight, the mean number of books ranged from 9.8 to 18.0.
- In grades nine through twelve, the mean number of books ranged from 2.3 to 5.8.

books taken home and student achievement on standardized reading tests by individual students. Statistically significant but small correlations existed between the number of books taken home and student achievement on standardized reading tests.

Parent Read-Aloud Program

In response to federal regulations requiring "a strong emphasis on training parents to work with their children at home," program administrators introduced a Parent Read-Aloud program in grades one through three and made its implementation a top priority. Sixty-five teachers, 780 parents, and 831 students enrolled in the Read-Aloud program, and eight of the ten staff development conferences devoted at least part of their agendas to some aspect of the program.

The objectives of the program were to enhance reading appreciation and interest among elementary school students by exposing them to good literature at an early age and to involve parents in the education of their children. Research has shown that very young children--as young as six months--can benefit from read-aloud activities and that early intervention is critical in the development of reading skills.

Teachers participated in the program voluntarily and developed a series of read-aloud kits which contained parent training materials, paperback books, school supplies, and various read-aloud exercises intended solely for the pleasure of the child. Reading materials for the kits were selected to be above the child's actual reading level but not so difficult as to

intimidate parents. In addition, teachers were responsible for recruiting parents, and they conducted 173 workshops to train parents in the proper use of the kits. They instructed parents to allow their children to take the initiative in choosing which exercises to do, if any, and not to monitor whether or not they completed the exercises.

STAFF DEVELOPMENT TRAINING

Staff development training included formal conferences and regular outreach to program teachers by the program coordinator and the three field supervisors. Supervisors demonstrated new instructional techniques and materials, reviewed diagnostic profiles, conducted small group meetings for teachers experiencing problems in specific instructional areas, and brought them together with successful teachers to learn new techniques.

Staff Development Training Conferences

An objective of the program evaluation was to assess the relationship between the pedagogical techniques presented at staff development conferences and their implementation in the classroom. A team of OREA observers attended seven of the ten staff development conferences held during the 1988-89 school year.

The purpose of staff development training was to introduce teachers to innovative pedagogical techniques and improve their effectiveness. Conference activities consisted primarily of lectures and demonstrations followed by whole or small group

discussions. Lectures were presented by program staff, college professors, teachers, and reading specialists. The principal areas of focus were the Parent Read-Aloud Program, reading through literature, and reading in content areas. Teacher guides, bibliographies, and informational materials were distributed to participants.

Workshop participants were generally responsive and attentive. Sessions covering the Parent Read-Aloud program were particularly animated, with teachers sharing concerns and ideas in terms of how best to implement the program in their respective schools. Attendance ranged from 38 to 75 teachers per conference, but a workshop held in conjunction with the Reading Skills Center and English as a Second Language programs attracted over 200 participants.

Parent Read-Aloud Program. One staff development conference was devoted entirely to the Parent Read-Aloud program. Teachers were organized into small groups by school, and each group was led by a program staff member. During the small group session, teachers engaged in role playing activities to familiarize themselves with new materials, discussed training parents in methods of home reading instruction, and tried to anticipate problems or questions that parents might have and devise satisfactory resolutions or answers. Over 150 read-aloud kits were given to teachers for each instructional level, and the workshops was followed up with a series of monthly memos written by and for conference participants.

Reading Through Literature. The focus of the Reading Through Literature workshops was the use of multicultural folktales for improving students' reading skills and appreciation of literature. The structure of folktales make them an ideal vehicle for teaching reading to elementary students: Folktales are about the lives of common people and are easily identifiable to children; they are full of action, begin quickly, and end just as abruptly; they contain clear-cut characters and embody universal themes.

Teachers were shown how to assist children in recognizing the common elements and motifs of folktales and help them identify the sequence of events. They were also encouraged to allow children to role-play the various characters in a story and to read their parts aloud to the class. Finally, in an effort to use folktales to teach writing skills, teachers were instructed to engage students creatively: for example, having students take the point of view of various characters in the story; write their own folktales using contemporary language; or predict possible outcomes to the story. The predicting outcomes technique was also identified as a method for teaching higher order reading and thinking skills by drawing on students' knowledge and experience.

Reading in Content Areas. Having students read in content areas helps them develop higher order reading and critical thinking skills by teaching them to "learn to read to learn." During the 1988-89 school year, special attention was given to

scientific vocabulary in an effort to help prepare students for mandatory testing.

In the workshops, teachers were encouraged to create a structure for guiding classroom discussions. For example, teachers were instructed to select concepts familiar to students and have them generate a list of related words by free association. Responses were recorded by a student and then read aloud to the class. The free association technique allows students to begin to connect their stock of knowledge and experience with what is unknown to them.

The use of declarative statements was also identified as a method for drawing on what students already know to assist them in the development of their critical thinking skills. Students are asked to agree or disagree with a particular statement, and by asking students whether or not they agree with the statement, teachers "create a situation in which students can sort through what they already know."

In-house Workshop. A number of topics were addressed during a staff development conference devoted exclusively to presentations by program teachers. They included:

- Utilizing Literature to Initiate Writing Activities;
- "Hats for Sale" -- Communication Activities Using Literature;
- Introducing Research Resources in the Primary Grades;
- Incorporating Thinking Strategies, Utilizing Whole Language;
- Teacher Created Primary Activities;
- Incorporating Poetry into the Language Experience Approach;

- "Cloze -- A Comprehensive Strategy in the Corrective Reading Room"; and
- Integrating Materials in the Corrective Reading Room.

Teacher Perception of Staff Development Training

The three Corrective Reading teachers interviewed by the OREA team had an average of 15 years experience as instructors in the program. They were very satisfied with staff development and felt they were successful in implementing the instructional methods presented at workshops. One teacher, however, asked for additional demonstrations and hands-on activities to reinforce training, while another suggested some time be set aside to conduct small group meetings with other teachers to discuss specific problems.

Pedagogical Techniques Observed in the Classroom

In one class, the cloze strategy of identifying signal words and contextual clues and cues was used to enhance reading comprehension. In addition, pedagogic techniques introduced in workshops on the Reading Through Literature and Reading in Content Areas strategies--role-playing characters, reading passages aloud, predicting outcomes of a story, and the use of free association to develop vocabulary skills--were widely observed in classrooms.

III. COMPUTER-ASSISTED INSTRUCTION

Thirty-eight teachers participated in the C.A.I. component of the Corrective Reading program. By the end of the 1988-89 school year, 60 nonpublic schools were on-line, an increase of 36 schools over the 1987-88 school year. Equipment installation and the training of C.A.I. staff continued through June 1989.

THE ORGANIZATION OF C.A.I.

Software Packages and Curricula

Hardware/software configurations are distinct and non-interchangeable, and a given school, therefore, can only work with one configuration. Nonpublic school principals selected the configurations for their respective schools. C.A.I. software was provided by five computer companies, and nonpublic school used ESC, WICAT, CCC, PLATO, or CNS software. The curriculum varied by software package but essentially followed the New York City reading curriculum. Packages for lower grades included an audio component. Nearly one-half of all students receiving computer-assisted instruction use ESC software (see Table 3).

Software packages differ with respect to instructional content and organization, but lesson sequences for all packages are determined by the difficulty level of the material. They also have a common principle of mastery learning: a student must sufficiently master the information at one level of difficulty before moving on to the next level. The level of mastery and the teacher's ability to adjust the level of mastery required to move from one lesson or set of lessons to the next varies according to

TABLE 3

Participation in the Corrective Reading Program of Full-Year Computer-Assisted Instruction Students by Software Package, Mode of Instruction, and Grade, 1988-89[a]

Grade	WICAT		CCC		ESC		PLATO		CNS	
	CAI	C.S.	CAI	C.S.	CAI	C.S.	CAI	C.S.	CAI	C.S.
1	5	8	0	0	0	16	0	0	0	0
2	74	31	58	0	111	71	0	0	10	0
3	108	31	83	0	200	88	0	0	0	0
4	103	23	85	0	187	69	0	0	0	0
5	94	19	86	0	168	65	0	0	0	0
6	98	24	62	0	206	55	0	0	0	0
7	41	16	56	0	182	46	0	0	0	0
8	49	16	33	0	145	13	0	0	0	0
9	0	0	86	0	0	0	30	58	0	0
10	0	0	25	20	0	0	41	54	0	0
11	0	0	14	14	0	0	36	36	0	0
12	0	0	21	8	0	0	2	5	0	0
Subtotal[b]	572	168	609	42	1201	423	109	153	10	
0										
Total	740		651		1624		262		10	

[a]Modes of instruction are C.A.I. and combination services (C.S.), i.e., instruction which combines C.A.I. and face-to-face instruction.

[b]Data on software package and mode of instruction were missing for 109 students.

- More than three-fourths of the 3,287 students (76 percent) received C.A.I. only. Less than one-fourth (24 percent) received combination services.
- Nearly one-half of all students used ESC software.

the software package. However, about 80 percent of the questions in a module must be answered correctly for a student to proceed. If a student consistently fails to meet the mastery criterion or if the criterion is consistently exceeded, then the difficulty level of the lessons must be adjusted.

Instructional Process

Chapter 1 teachers monitor student progress and intervene in the instructional process via computer from the Board of Education administrative center--evaluating printouts of student progress, adjusting the difficulty level of the software, previewing student lessons, and communicating with non-instructional technicians. Modems connect the administrative center with Chapter 1 computer labs in the nonpublic school sites, and Chapter 1 teachers speak to noninstructional technicians by telephone.

Modes of Instruction

C.A.I. was offered via two modes of instruction: C.A.I. alone; and combination services, i.e., C.A.I. combined with face-to-face instruction at an instructional site. The majority of students, 76 percent, received C.A.I. by itself and approximately 24 percent of C.A.I. students received combination services (see Table 3).

Students from 14 nonpublic schools received combination services instruction. They worked two days a week in computer labs in sessions lasting 30 to 45 minutes, and once a week they received face-to-face instruction at an instructional site by the

Chapter 1 teacher who monitored their computer-assisted instruction. Classes for the face-to-face component lasted 45 to 60 minutes. Students receiving C.A.I. by itself worked in Chapter 1 computer labs in their nonpublic schools from one to five days a week, in sessions lasting 20 to 50 minutes. More than 86 percent of these students attended class at least twice a week.

THE IMPLEMENTATION OF C.A.I.

Training Corrective Reading Staff

Software companies provided teacher manuals which contain information on the operation of the system, the curriculum, and the interpretation of individual and class progress reports. In addition, teachers received training from software company representatives who scheduled training sessions throughout the school year on specific topics and were available to resolve individual problems in person and by telephone. They also trained non-instructional technicians and established hot lines to provide technical assistance. The training task was made difficult by the fact that new schools were brought on-line throughout the year and teachers required many different levels of training. Moreover, teachers spent one to four days a week in the field teaching the face-to-face component of combination services and sometimes were not present for training sessions at the administrative center.

Adapting Software Packages for Chapter 1 Students

All five software packages were originally designed for learning situations where a teacher is physically present while students work at computers. A major task for software companies and Chapter 1 administrators, therefore, was to find ways of adapting learning systems to a situation where teachers were not physically present. Teacher feedback contributed in varying degrees--depending on the software company--to the adaptation of program software.

Improving Teacher Expertise

WICAT Systems prepared a learning improvement plan through which C.A.I. teachers can become more proficient. This plan is based on a model of three stages of teacher proficiency. Successful adaptation of instructional systems to the learning needs of students requires teachers to progress to the third stage. An abbreviated version of these stages is:

1. NOVICES use the system's default settings and leave control of instruction to the system.

2. PRACTITIONERS guide students through the system, use reports, and control the sequence of on-line instruction.

3. INTEGRATORS and EXTENDERS solve learning problems and create learning opportunities beyond the normal use patterns of the system's instructional design. They find ways to use materials such as workbooks and homework assignments, along with C.A.I., in order to better meet the needs of individual students.

Improving Program Implementation

Successful implementation depends on the capacity of the software to respond to the individual needs of students and on

the teacher's skill in guiding students through the various levels of instruction. In order to develop the responsiveness of the software to the needs of Chapter 1 students, program administrators and teachers must continue to work with software company representatives to discover ways to revise the software and thus improve remediation. Ultimately, the availability and responsiveness of company representatives and the flexibility of instructional personnel will be critical to the successful implementation of the program.

SURVEY OF C.A.I. TEACHERS

A survey was completed by all 38 C.A.I. Corrective Reading teachers at the end of the 1988-89 school year (see Appendix A). The survey was designed to elicit teacher perceptions of the C.A.I. mode of instruction. Of the five different software packages employed, 15 teachers used ESC; six used WICAT; three used CCC; two used PLATO; and seven used more than one program. The remaining five teachers did not specify a software package, and the CNS package was not identified by any individual teacher.

The majority (82 percent) of the teachers had ten or more years of experience teaching in Chapter 1 programs. Two-thirds of all teachers were in their second year of C.A.I. instruction; one-third were C.A.I. novices. However, no teacher had any C.A.I. experience prior to their participation in the program. Nine teachers had some computer experience, but their experience consisted primarily of informal computer training or college level course work.

Grade Levels and Teacher Assignments

Students from grades one through twelve participated in the program, and the majority were in grades two through eight. Teachers were responsible for teaching many different grade levels, and 82 percent taught at least six different grade levels.

Teaching assignments included C.A.I., combination services, and mixed assignments, i.e., teaching in both the C.A.I. and the face-to-face mode of instruction. Most respondents had mixed assignments.

Communication With Noninstructional Technicians and Students

Most teachers (61 percent) worked with one noninstructional technician; some teachers with their students spread out over several schools worked with up to four noninstructional technicians. Teachers generally spoke with the technicians several times a week. The two most frequently cited reasons were to adjust the difficulty level of software and to verify attendance.

Teachers had three ways to communicate with their students--telephone, electronic mail, and face-to-face. Most teachers communicated with an average of 33 students per week. In general, combination services teachers used their face-to-face instructional time to communicate with students, and C.A.I. teachers used the telephone.

When teachers were asked how they thought communication with students and noninstructional technicians could be improved, 58

percent suggested additional conference time. Other suggestions included providing additional telephones and computers, extending the availability of the hot line from 3:00 p.m. to 5:00 p.m., teaching students to reach teachers by telephone or computer, and providing more flexibility in scheduling.

Software Generated Reports

Ninety-two percent of the respondents believed that the software-generated reports adequately tracked student progress. Nevertheless, they felt that progress reports needed more specific information about student errors, more information about branching, and more information about student progress in terms of grade level. Ninety-two percent of the respondents also reported that while principals were satisfied with student progress reports, they were unsure of how to interpret them properly.

Previewing Lessons

In order to become familiar with C.A.I. lesson contents, teachers had to preview student lessons on computers at the administrative center. However, teachers reported previewing only 18 to 42 percent of their lessons.

Placement into the Software Curriculum

Initial placement into the software curriculum is important since students must work at the appropriate difficulty level in order to learn effectively. If the placement is accurate, less time will be taken up finding the proper level at which students should be working. However, while 92 percent of the teachers

knew that their software package provided a placement test, only 32 percent of them actually used it. Instead, teachers reported placing students in the curriculum by means of standardized tests administered at the beginning of the school year.

Adjusting Software Difficulty Levels

While in some cases it is possible for the software to adjust the difficulty level automatically, such adjustments do not always meet the individual needs of students. Teachers monitor student achievement by looking at progress reports and fine-tune the difficulty level of lessons. However, most teachers (55 percent) reported adjusting the difficulty level of their software once a month; 27 percent adjusted it less than once a month; and 18 percent adjusted it twice a month.

Responsiveness of Software Companies

Twenty-one teachers rated the software companies on their responsiveness to teacher requests and suggestions. Most teachers rated the software companies as being moderately responsive to their requests and suggestions.

Combination Services

Of the 11 combination services teachers who responded, six reported using their face-to-face instructional time to teach skills not taught by the computer--writing, language development, language arts, and literature--and five reported working on areas of difficulty identified by computer-generated student progress reports. In addition, seven teachers compared face-to-face

instruction and C.A.I. in the combination services mode of instruction. They offered the following observations:

- C.A.I. stresses language mechanics and expression skills, and face-to-face instruction places more emphasis on literature and writing.
- Face-to-face instruction allows more attention to meeting the individual needs of students.
- The C.A.I. curriculum is skills oriented; face-to-face instruction follows a more holistic approach.

Teacher Suggestions for Improving Lesson Content

Teachers offered the following suggestions for improving lessons:

- Materials such as workbooks should accompany software lessons.
- The discrepancy between the difficulty level of sight words and story comprehension should be corrected.
- Less difficult reading material should be included.
- Directions to students should be simplified.
- Reinforcement of basic skills needs to be improved. If a student is having difficulty with one cluster of skills, the software does not permit dropping the student to a lower difficulty level for that particular skill.
- The software needs more "branching." If a student gets a wrong answer, the software presents the question in a different form. However, if the student keeps getting a particular type of question wrong, there are not enough alternate forms, or "branches," for effective remediation.
- The way the software corrects errors needs to be improved.
- Concepts should be developed more fully.

IV. STUDENT OUTCOMES

ATTENDANCE

Aggregate attendance data was provided by the program administration. Overall attendance for the Corrective Reading program was 90 percent.

METHODS USED TO EVALUATE STUDENT ACHIEVEMENT

The impact of the Corrective Reading program on student achievement in reading was determined by comparing students' performance on standardized tests against the program objectives, a statistically significant mean gain between the pretest and the posttest. Pretests were administered in fall 1988, and posttests were administered in spring 1989.

First grade students took the Environment, Letters and Sounds, and Aural Comprehension subtests of the Stanford Early School Achievement Test (SESAT), and students in grades two through twelve took the Reading Comprehension, Language Mechanics, and Language Expression subtests of the California Achievement Test (CAT). Students' raw scores were organized by grade and converted to normal curve equivalents (N.C.E.s).* Statistical analyses were carried out on the converted N.C.E. scores, and correlated *t*-tests were used to determine whether mean differences were statistically significant.

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*Normal curve equivalent scores are similar to percentile ranks but, unlike percentile ranks, are based on an equal-interval scale ranging from 1 to 99, with a mean of 50 and a standard deviation of approximately of 21. Because N.C.E. scores are equally spaced, mathematical and statistical calculations such as averages are meaningful; in addition, comparisons of N.C.E. scores may be made across different achievement tests.

Statistical significance indicates whether the changes in achievement are real or occur by chance. However, achieving statistically significant mean gains does not address the issue of whether the mean gains are important to the students' educational development. For example, the importance of achieving statistically significant mean gains can be exaggerated for large groups of students because even small mean gains by large groups of students will generally be statistically significant. Similarly, the importance of not achieving statistically significant mean gains can be overstated for small groups of students because it is more difficult for small groups to achieve mean gains that are statistically significant. Thus, an effect size (E.S.)* is reported for each mean difference to indicate whether each mean gain or loss was educationally meaningful.

Student Achievement by Mode of Instruction

Student scores also were organized by the mode of instruction: face-to-face, C.A.I., and combination services (i.e., face-to-face instruction combined with computer-assisted instruction). Analyses of variance with Scheffe post-hocs were conducted to determine whether face-to-face, C.A.I., or combination services produced the highest mean gains.

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*The effect size, developed by Jacob Cohen, is the ratio of the mean gain to the standard deviation of the gain. This ratio provides an index of improvement irrespective of the size of the sample. According to Cohen, .2 is a small effect size, .5 is a moderate effect size, and .8 is a large effect size. Only effect sizes of .8 and above are considered educationally meaningful.

ACHIEVEMENT FINDINGS

Face-to-Face: First Grade

Table 4 presents the results of student achievement on the Environment, Letters and Sounds, and Aural Comprehension subtests of the Stanford Early School Achievement Test.

- Mean gains were 9.9 N.C.E.s, 7.7 N.C.E.s, and 11.7 N.C.E.s on the three subtests, respectively.
- Mean gains were statistically significant and represented moderate effect sizes.

Face-to-Face: Grades Two Through Twelve

Reading Comprehension. Table 5 presents the results of student achievement, by grade, on the Reading Comprehension subtest of the California Achievement Test.

- The overall mean gain of 12.5 N.C.E.s was statistically significant and represented an educationally meaningful effect size.
- Mean gains were statistically significant and ranged from 9.9 N.C.E.s for grades five and ten to 15.2 N.C.E.s for grade three.
- Effect sizes were educationally meaningful.

Language Mechanics. Table 6 presents the results of student achievement, by grade, on the Language Mechanics subtest of the California Achievement Test.

- The overall mean gain of 9.1 N.C.E.s. was statistically significant and represented a moderate effect size.
- With the exception of grade twelve, mean gains were statistically significant and ranged from five N.C.E.s for grade eleven to 12.8 N.C.E.s for grade two.
- The effect size for grade eleven was large. All other effect sizes were moderate.

TABLE 4

Mean N.C.E. Differences on the Subtests of the SESAT by Full-Year First Grade Face-to-Face Students in the Corrective Reading Program, 1988-89

Subtest	N	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference* Mean	Difference* S.D.	Effect Size
Environment	135	13.7	10.9	23.6	13.9	9.9	14.4	0.7
Letters and Sounds	135	16.5	12.6	24.2	15.8	7.7	16.1	0.5
Aural Comprehension	135	17.5	13.0	29.2	15.0	11.7	16.8	0.7

*Mean differences were statistically significant at the $p \leq .05$ level.

- Mean gains were 9.9 N.C.E.s, 7.7 N.C.E.s, and 11.7 N.C.E.s on the three subtests, respectively.
- Mean gains were statistically significant and represented moderate effect sizes.

TABLE 5

Mean N.C.E. Differences
on the Reading Comprehension Subtest of the CAT
by Full-Year Face-to-Face Students
in the Corrective Reading Program by Grade, 1988-89

Grade	N	Pretest		Posttest		Difference[a]		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
2	699	21.9	12.5	34.6	14.1	12.7	16.3	0.8
3	751	20.6	12.2	35.8	13.1	15.2	13.6	1.1
4	753	22.1	12.3	35.2	11.7	13.1	13.1	1.0
5	644	24.3	10.8	34.2	11.0	9.9	10.4	1.0
6	528	24.4	12.8	37.4	12.7	13.0	12.0	1.1
7	375	28.3	12.2	38.9	10.4	10.6	11.4	0.9
8	141	29.0	11.1	39.1	12.8	10.1	9.9	1.0
9	22	18.6	10.1	33.5	13.4	14.9	9.5	1.6
10	14	22.4	11.6	32.3	13.4	9.9	6.2	1.6
11	14	15.1	8.8	27.1	9.8	12.0	7.1	1.7
12	11	9.1	8.1	20.5	12.1	11.4	10.9	1.0
Total	3952	23.2	12.3	35.7	12.5	12.5	13.1	1.0

[a]Mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 12.5 N.C.E.s was statistically significant and represented an educationally meaningful effect size.
- Mean gains were statistically significant and ranged from 9.9 N.C.E.s for grades five and ten to 15.2 N.C.E.s for grade three.
- Effect sizes were educationally meaningful.

TABLE 6

Mean N.C.E. Differences
on the Language Mechanics Subtest of the CAT
by Full-Year Face-to-Face Students
in the Corrective Reading Program by Grade, 1988-89

Grade	N	Pretest		Posttest		Difference		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
2	697	19.7	11.2	32.5	16.4	12.8[a]	20.4	0.6
3	752	24.5	14.3	35.0	14.7	10.5[a]	14.7	0.7
4	741	30.4	15.4	38.4	16.0	8.0[a]	15.4	0.5
5	631	30.5	15.5	39.0	15.8	8.5[a]	14.2	0.6
6	522	32.1	17.1	39.0	15.2	6.9[a]	13.8	0.5
7	373	36.9	15.8	44.3	14.9	7.4[a]	12.5	0.6
8	140	39.0	15.8	44.8	15.7	5.8[a]	12.4	0.5
9	22	33.0	19.0	40.7	15.8	7.7[a]	12.7	0.6
10	13	26.2	16.6	33.9	15.4	7.7	14.9	0.5
11	14	26.1	14.2	31.1	11.1	5.0[a]	5.7	0.9
12	10	24.1	14.6	31.0	16.8	6.9	11.9	0.6
Total	3,915	28.5	16.8	37.6	15.9	9.1[a]	15.7	0.6

[a] The mean difference was statistically significant at the $p \leq .05$ level.

- The overall mean gain of 9.1 N.C.E.s. was statistically significant and represented a moderate effect size.
- With the exception of grade twelve, mean gains were statistically significant and ranged from five N.C.E.s for grade eleven to 12.8 N.C.E.s for grade two.
- The effect size for grade eleven was large. All other effect sizes were moderate.

Language Expression. Table 7 presents the results of student achievement, by grade, on the Language Expression subtest of the California Achievement Test.

- The overall mean gain of 9.9 N.C.E.s. was statistically significant and represented a moderate effect size.
- With the exception of grade ten, mean gains were statistically significant and ranged from seven N.C.E.s for grade ten to 13 N.C.E.s for grade three.
- Effect sizes were educationally meaningful for grades three, five, seven, eight, eleven, and twelve. All other effect sizes were moderate.

Computer-Assisted Instruction: Grade One

Table 8 presents the results of student achievement on the Environment, Letters and Sounds, and Aural Comprehension subtests of the Stanford Early School Achievement Test.

- First grade students achieved a statistically significant mean gain of 7.2 N.C.E.s on the Environment subtest of the SESAT. This represented a moderate effect size.
- The mean decrease of 8.2 N.C.E.s on the Letters and Sounds subtest was not statistically significant and represented a small effect size. However, the number of students taking the test was small--17 students--and it is more difficult for small groups to achieve mean gains that are statistically significant.
- The mean gain of 3.9 N.C.E.s on the Aural Comprehension subtest was not statistically significant and represented a small effect size.

Computer-Assisted Instruction: Grades Two Through Twelve

Reading Comprehension. Table 9 presents the results of student performance by grade on the Reading Comprehension subtest of the California Achievement Test. Of the 2,713 students tested, 1,297 used ESC software; 623 used WICAT; 495 used CCC; 222 used PLATO. Data on software were missing for 76 students.

TABLE 7

Mean N.C.E. Differences
on the Language Expression Subtest of the CAT
by Full-Year Face-to-Face Students
in the Corrective Reading Program by Grade, 1988-89

Grade	N	Pretest		Posttest		Difference		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
2	700	22.9	12.7	31.9	15.1	9.0*	16.7	0.5
3	747	22.1	14.6	35.1	14.9	13.0*	14.5	0.9
4	748	26.1	13.8	35.1	13.5	9.0*	13.9	0.6
5	640	25.7	13.2	35.4	12.6	9.7*	12.7	0.8
6	517	28.4	13.8	37.0	13.0	8.6*	12.0	0.7
7	374	32.5	12.8	41.8	13.2	9.3*	11.6	0.8
8	140	30.2	12.8	39.7	13.0	9.5*	11.9	0.8
9	22	28.2	14.6	36.8	14.7	8.6*	13.7	0.6
10	12	22.8	14.9	29.8	17.7	7.0	11.7	0.6
11	13	23.8	12.7	34.6	5.9	10.8*	10.0	1.1
12	10	19.4	14.5	28.0	11.8	8.6*	10.3	0.8
Total	3,923	25.7	13.9	35.6	14.1	9.9*	13.9	0.7

* The mean difference was statistically significant at the $p \leq .05$ level.

- The overall mean gain of 9.9 N.C.E.s. was statistically significant and represented a moderate effect size.
- With the exception of grade ten, mean gains were statistically significant and ranged from seven N.C.E.s for grade ten to 13 N.C.E.s for grade three.
- Effect sizes were educationally meaningful for grades three, five, seven, eight, eleven, and twelve. All other effect sizes were moderate.

TABLE 8

Mean N.C.E. Differences on the Subtests of the SESAT by Full-Year First Grade Computer-Assisted Instruction Students in the Corrective Reading Program, 1988-89

Subtest	N	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference Mean	Difference S.D.	Effect Size
Environment	17	8.3	7.3	15.5	15.0	7.2[a]	10.8	0.7
Letters and Sounds	17	24.6	27.1	16.4	15.0	-8.2	25.0	0.3
Aural Comprehension	13	12.7	8.9	16.6	12.5	3.9	10.2	0.4

[a] The mean gain was statistically significant at the $p \leq .05$ level.

- First grade students achieved a statistically significant mean gain of 7.2 N.C.E.s on the Environment subtest of the SESAT. This represented a moderate effect size.
- The mean decrease of 8.2 N.C.E.s on the Letters and Sounds subtest was not statistically significant and represented a small effect size.
- The mean gain of 3.9 N.C.E.s on the Aural Comprehension subtest was not statistically significant and represented a small effect size.

TABLE 9

Mean N.C.E. Differences
on the Reading Comprehension Subtest of the CAT
by Full-Year Computer-Assisted Instruction Students
in the Corrective Reading Program by Grade, 1988-89

		Pretest		Posttest		Difference*		Effect
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Size
2	287	24.1	12.8	30.6	15.2	6.5	16.6	0.4
3	425	22.2	13.3	32.7	15.5	10.5	13.3	0.8
4	398	22.4	11.7	32.4	12.3	10.0	12.6	0.8
5	364	24.8	11.0	31.9	11.8	7.1	11.4	0.6
6	398	27.6	12.3	32.9	12.6	5.3	11.8	0.5
7	291	29.2	12.4	36.5	10.9	7.3	11.8	0.6
8	213	28.1	12.3	35.9	12.4	7.8	11.1	0.7
9	138	27.2	11.7	35.2	10.0	8.0	8.0	1.0
10	110	31.6	12.6	38.7	11.8	7.1	9.3	0.8
11	74	31.0	12.3	38.2	9.4	7.2	9.8	0.7
12	15	19.8	8.4	31.9	8.3	12.1	5.5	2.2
Total	2,713	25.7	12.6	33.5	13.0	7.8	12.5	0.6

* Mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 7.8 N.C.E.s was statistically significant and represented a moderate effect size.
- Mean gains for all grades were statistically significant. They ranged from 5.3 N.C.E.s for grade six to 12.1 N.C.E.s for grade twelve.
- Effect sizes for grades three, four, nine, ten, and twelve were educationally meaningful. All other effect sizes were small or moderate.

- The overall mean gain of 7.8 N.C.E.s was statistically significant and represented a moderate effect size.
- Mean gains for all grades were statistically significant. They ranged from 5.3 N.C.E.s for grade six to 12.1 N.C.E.s for grade twelve.
- Effect sizes for grades three, four, nine, ten, and twelve were educationally meaningful. All other effect sizes were small or moderate.

Language Mechanics. Table 10 presents the results of student performance by grade on the Language Mechanics subtest of the California Achievement Test. Of the 2,695 students tested, 1,290 used ESC software; 621 used WICAT; 489 used CCC; and 220 used PLATO. Data on software were missing for 75 students.

- The overall mean gain of 4.2 N.C.E.s was statistically significant and represented a small effect size.
- With the exception of grade twelve, all mean gains were statistically significant. Mean gains ranged from 1.4 N.C.E.s for grade eleven to 6.0 N.C.E.s for grade ten.
- Effect sizes for grades ten and twelve were moderate. All other effect sizes were small.

Language Expression. Table 11 presents the results of student performance, by grade, on the Language Expression subtest of the California Achievement Test. Of the 2,692 students tested, 1,288 used ESC software; 617 used WICAT; 490 used CCC; and 220 used PLATO. Data on software were missing for 75 students.

- The overall mean gain of 5.7 N.C.E.s was statistically significant and represented a small effect size.
- With the exception of grade twelve, mean gains were statistically significant. They ranged from 3.9 N.C.E.s for grades two and eleven to 9.3 N.C.E.s for grade nine.
- Effect sizes for grades nine and ten were large. All other effect sizes were small to moderate.

TABLE 10

Mean N.C.E. Differences
on the Language Mechanics Subtest of the CAT
by Full-Year Computer-Assisted Instruction Students
in the Corrective Reading Program by Grade, 1988-89

Grade	N	Pretest		Posttest		Difference		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
2	285	25.2	16.9	27.6	16.9	2.4*	19.0	0.1
3	424	25.1	15.6	30.9	15.6	5.8*	14.6	0.4
4	396	30.7	16.6	36.3	16.7	5.6*	15.3	0.4
5	363	31.1	16.2	35.3	15.9	4.2*	15.5	0.3
6	398	32.5	16.5	36.1	16.7	3.6*	15.0	0.2
7	287	36.4	16.3	39.9	14.9	3.5*	13.4	0.3
8	211	36.9	17.5	39.9	16.2	3.0*	13.6	0.2
9	136	41.9	15.0	45.7	13.1	3.8*	11.4	0.3
10	107	40.5	15.3	46.5	16.3	6.0*	11.5	0.5
11	74	45.0	15.9	46.4	13.9	1.4*	12.0	0.1
12	14	30.9	10.1	38.1	9.6	7.2	10.2	0.7
Total	2,695	32.0	17.1	36.2	16.7	4.2*	14.9	0.3

* The mean difference was statistically significant at the $p \leq .05$ level.

- The overall mean gain of 4.2 N.C.E.s was statistically significant and represented a small effect size.
- With the exception of grade twelve, all mean gains were statistically significant. Mean gains ranged from 1.4 N.C.E.s for grade eleven to 6.0 N.C.E.s for grade ten.
- Effect sizes for grades ten and twelve were moderate. All others effect sizes were small.

TABLE 11

Mean N.C.E. Differences on the Language Expression Subtest of the CAT by Full-Year Computer-Assisted Instruction Students in the Corrective Reading Program by Grade, 1988-89

Grade	N	Pretest		Posttest		Difference		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
2	284	25.2	12.7	29.1	15.7	3.9*	15.5	0.3
3	421	22.5	15.5	29.1	16.6	6.6*	14.5	0.5
4	397	25.0	14.3	31.8	14.0	6.8*	14.8	0.5
5	363	25.5	13.5	30.7	14.5	5.2*	13.7	0.4
6	395	27.6	13.4	33.7	14.8	6.1*	13.0	0.5
7	286	31.9	13.6	36.7	12.7	4.8*	12.2	0.4
8	212	29.5	13.0	33.7	12.4	4.2*	10.4	0.4
9	136	30.4	12.1	37.7	11.3	7.3*	10.1	0.8
10	110	30.7	13.4	40.0	12.1	9.3*	11.7	0.8
11	74	38.0	10.4	41.9	9.9	3.9*	9.9	0.4
12	14	29.6	9.4	33.9	6.3	4.3	8.8	0.5
Total	2,692	27.1	14.1	32.8	14.6	5.7*	13.4	0.4

* These mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 5.7 N.C.E.s was statistically significant and represented a small effect size.
- With the exception of grade twelve, mean gains were statistically signficant. They ranged from 3.9 N.C.E.s for grades two and eleven to 9.3 N.C.E.s for grade nine.
- Effect sizes for grades nine and ten were large. All other effect sizes were small to moderate.

Reading Achievement by Mode of Instruction

Table 12 presents data on student achievement on the Reading Comprehension, Language Mechanics, and Language Expression subtests of the CAT for students in grades two through eight by mode of instruction: face-to-face, C.A.I. only, and combination services. C.A.I. only students used WICAT, ESC, and CCC software, and combination services students used WICAT and ESC software.

- On all three subtests of the CAT, students in grades two through eight who received face-to-face instruction made mean gains that were significantly higher than those for C.A.I. and combination services students.
- There were no statistically significant differences in mean gains between C.A.I. only and combination services modes of instruction.

Table 13 presents data on student achievement on the Reading Comprehension, Language Mechanics, and Language Expression subtests of the CAT for students in grades nine through twelve by mode of instruction. C.A.I. only students used CCC and PLATO software, and combination services students used WICAT and ESC software.

- On the Reading Comprehension subtest of the CAT, students in grades nine through twelve who received face-to-face instruction made mean gains that were significantly higher than those for C.A.I. only or combination services students.
- For students in grades nine through twelve, there was no significant difference in mean gains by mode of instruction on the Language Mechanics and Language Expression subtests of the CAT.
- There were no statistically significant differences in mean gains between C.A.I. only and combination services modes of instruction.

TABLE 12

Overall Mean N.C.E. Differences on the Subtests of the CAT by Full-Year Students in Grades Two through Eight in the Corrective Reading Program by Mode of Instruction, 1988-89

Subtest	Face-to-Face N	Face-to-Face Mean Gain*	Face-to-Face S.D.	C.A.I. only N	C.A.I. only Mean Gain*	C.A.I. only S.D.	Combination Services N	Combination Services Mean Gain*	Combination Services S.D.
Reading Comprehension	3891	12.5	13.2	1843	7.4	12.9	533	9.6	12.6
Language Mechanics	3856	9.1	15.7	1833	3.8	15.4	531	5.8	14.8
Language Expression	3866	9.9	14.0	1828	5.3	14.1	530	6.4	12.5

* Mean differences were statistically significant at the $p \leq .05$ level.

- On all three subtests of the CAT, students in grades two through eight who received face-to-face instruction made mean gains that were significantly higher than those for C.A.I. only and combination services students.
- There were no statistically significant differences in mean gains between C.A.I. only and combination services modes of instruction.

TABLE 13

Overall Mean N.C.E. Differences on the Subtests of the CAT by Full-Year Students in Grades Nine Through Twelve in the Corrective Reading Program by Mode of Instruction, 1988-89

Subtest	Face-to-Face			C.A.I. only			Combination Services		
	N	Mean Gain[a]	S.D.	N	Mean Gain[a]	S.D.	N	Mean Gain[a]	S.D.
Reading Comprehension	61	12.4	8.6	172	7.7	7.5	165	7.7	10.0
Language Mechanics	59	6.9	11.6	169	4.5	10.8	162	3.7	12.4
Language Expression	57	8.8	11.7	169	7.3	10.3	165	6.9	11.2

[a] Mean differences were statistically significant at the $p \leq .05$ level.

- On the Reading Comprehension subtest of the CAT, students in grades nine through twelve who received face-to-face instruction made mean gains that were significantly higher than those for C.A.I.- only or combination services students.
- For students in grades nine through twelve, there was no significant difference in mean gains by mode of instruction on the Language Mechanics and Language Expression subtests of the CAT.
- There were no statistically significant differences in mean gains between C.A.I. only and combination services modes of instruction.

COMPARISON WITH PAST YEARS

For comparisons of student achievement with that in previous years, the number of students, mean gain, standard deviation of the mean gain, and effect size are reported. From 1985-86 through the 1987-88 school year, the program's criterion for success was a mean gain of five N.C.E.s from pretest to posttest. However, in 1988-89, the criterion for success was changed to a statistically significant mean gain from pretest to posttest.

Grade One, 1985-86 to 1988-89

Table 14 presents data on student achievement on the Environment, Letters and Sounds, and Aural Comprehension subtests of the SESAT for students receiving face-to-face instruction.

- With the exception of the Letters and Sounds subtest, mean gains for the years 1985-86 through 1987-88 met the program criterion for success, a five N.C.E. mean gain.
- Mean gains on all three subtests for 1988-89 met the program criterion for success, a statistically significant mean gain.
- For the period 1986-86 through 1988-89, effect sizes for the Letters and Sounds subtest were small and for the Aural Comprehension subtest, they were moderate. For the Environment subtest, effect sizes fluctuated between small and moderate.

Grades Two Through Twelve

Table 15 presents data on overall student achievement on the Reading Comprehension subtest of the CAT. In 1985-86, the data are for students receiving face-to-face instruction. In 1987-88 and 1988-89, data includes students receiving face-to-face and computer-assisted instruction.

TABLE 14

Mean N.C.E. Differences by Full-Year First Grade Students Receiving Face-to-Face Instruction in the Corrective Reading Program by Subtest of the SESAT, 1985-86 through 1988-89

Subtest	Year	N[a]	Mean Gain	S.D.	Effect Size
Environment	1985-86	382	8.2[b]	13.8	0.6
	1986-87	128	6.2[b]	15.5	0.4
	1987-88	127	8.7[b]	16.5	0.5
	1988-89	135	9.9[b]	14.4	0.7
Letters and Sounds	1985-86	382	3.3[b]	16.0	0.2
	1986-87	127	-0.2	16.9	0.0
	1987-88	130	3.6[b]	18.3	0.2
	1988-89	135	7.7[b]	16.1	0.5
Aural Comprehension	1985-86	381	8.4[b]	14.1	0.6
	1986-87	126	9.6[b]	16.1	0.6
	1987-88	125	13.5[b]	18.2	0.7
	1988-89	135	11.7[b]	16.8	0.7

[a] The number of participants was affected by the 1985 Supreme Court decision restricting services at nonpublic school sites.

[b] The mean gain was statistically significant at the $p \leq .05$ level.

- With the exception of the Letters and Sounds subtest, mean gains for the years 1985-86 through 1987-88 met the program criterion for success, a five N.C.E. mean gain.
- Mean gains on all three subtests for 1988-89 met the program criterion for success, a statistically significant mean gain.
- For the period 1986-86 through 1988-89, effect sizes for the Letters and Sounds subtest were small and for the Aural Comprehension subtest, they were moderate. For the Environment subtest, effect sizes fluctuated between small and moderate.

TABLE 15

Mean N.C.E. Differences by Full-Year Students
in the Corrective Reading Program
by Subtest of the CAT, 1985-86 through 1988-89

Year	Number of Students[a]	Mean Gain[b]	Standard Deviation	Effect Size
1985-86	10,045	10.8	14.8	0.7
1986-87	5,743	11.8	15.6	0.8
1987-88	4,516[c]	4.6	16.3	0.3
1988-89	7,943[c]	12.5	13.1	1.0

[a] The number of participants was affected by the 1985 Supreme Court decision restricting services at nonpublic school sites.

[b] Mean gains were statistically significant at the $p \leq .05$ level.

[c] Includes face-to-face and C.A.I. students.

- Mean gains for the 1985-86 and 1986-87 school years met the program criterion for success, a five mean N.C.E. gain. The mean gain in 1987-88 dropped to 4.6 N.C.E.s and did not meet the program criterion for success.
- The mean gain of 12.5 N.C.E.s for the 1988-89 school year met the program's criterion for success, a statistically significant mean gain.
- Effect sizes fluctuated. In 1985-86, it was moderate, and in 1987-88, it was small. In 1986-87 and 1988-89, effect sizes were large and educationally meaningful.

- Mean gains for the 1985-86 and 1986-87 school years met the program criterion for success, a five mean N.C.E. gain. The mean gain in 1987-88 dropped to 4.6 N.C.E.s and did not meet the program criterion for success.

- The mean gain of 12.5 N.C.E.s for the 1988-89 school year met the program's criterion for success, a statistically significant mean gain.

- Effect sizes fluctuated. In 1985-86, it was moderate, and in 1987-88, it was small. In 1986-87 and 1988-89, effect sizes were large and educationally meaningful.

V. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

During the 1988-89 school year, the Corrective Reading program served a total of 7,943 students at 162 instructional sites: 4,656 students received face-to-face instruction, and 3,287 students received computer-assisted instruction (C.A.I.). In general, the program achieved its goals--improving students' reading and writing skills, encouraging them to read for pleasure, and increasing their motivation for learning.

Since the 1985 Supreme Court decision, program staff have instructed students at Chapter 1 program sites--public schools, leased neutral sites, mobile instructional units, and non-denominational schools. In 1987-88, the program began C.A.I. at 24 nonpublic school sites, and by the end of the 1988-89 school year, an additional 36 nonpublic schools were on-line.

The Parent Read-Aloud Program

In 1988-89, the program introduced a Parent Read-Aloud program in grades one through three. The objective was to enhance students appreciation of and interest in reading by exposing them to good literature at an early age. Teachers recruited parents, conducted parent-training workshops, and developed read-aloud kits containing parent-training materials, paperback books, school supplies, and exercises. In all, 65 teachers, 780 parents, and 831 students participated in the program.

Staff Development Training

Staff development training included formal conferences and regular outreach to program teachers by the program coordinator and the three field supervisors. Conference activities consisted primarily of lectures and demonstrations followed by whole or small group discussions. The principal areas of focus were the Parent Read-Aloud Program, reading through literature, and reading in content areas. Workshop participants were generally responsive and attentive, and teachers were satisfied with staff development training and felt they were successful in implementing the instructional methods presented at workshops.

Computer-Assisted Instruction

C.A.I. was offered via two modes of instruction: C.A.I. alone; and combination services, i.e., C.A.I. combined with face-to-face instruction at an instructional site. The majority of students received C.A.I. by itself, and approximately 24 percent of C.A.I. students received combination services. Chapter 1 teachers monitored student progress and intervened in the instructional process via computer from a Board of Education administrative center. However, the software packages were originally designed for learning situations where a teacher is physically present while students work at computers and had to be adapted to a situation where teachers were not physically present.

Teachers used manuals which contain information on the operation of the system, the software curriculum, and the

interpretation of individual and class progress reports and received training from software companies. However, the training task was made difficult by the fact that new schools were brought on-line throughout the year and teachers required many different levels of training. Moreover, teachers spent one to four days a week in the schools teaching the face-to-face mode of instruction and sometimes were not present for C.A.I. training sessions at the administrative center.

Successful implementation of C.A.I. depends on the capacity of the software to respond to the needs of students and on the teacher's skill in guiding students through the curriculum. In order to develop the responsiveness of the software to the needs of students, program administrators and teachers must continue to work with company representatives to discover ways to revise the software and improve remediation. Ultimately, the availability and responsiveness of company representatives and the flexibility of instructional personnel will be critical to the successful implementation of the program.

Survey of C.A.I. Teachers. A survey, designed to elicit teacher perceptions of the C.A.I. mode of instruction, was completed by all 38 C.A.I. teachers at the end of the 1988-89 school year. The majority of the teachers had ten or more years experience teaching in Chapter 1 programs. Two-thirds of them were in their second year of C.A.I. instruction; one-third were C.A.I. novices; and no teachers had any C.A.I. experience prior to their participation in the program.

Teaching assignments included C.A.I., combination services, and mixed assignments, i.e., teaching in both the C.A.I. and the face-to-face mode of instruction. Most teachers had mixed assignments. They also were responsible for teaching different grade levels, and 82 percent taught six or more different grade levels.

Additional findings include:

- Teachers previewed only 18 to 42 percent of their lessons.
- Only 32 percent of the teachers used the initial placement test accompanying the software package.
- Communication with students could be improved.
- Reinforcement of basic skills component of the software needs to be improved.
- The software needs more branching.

Student Achievement

In general, students in all grades on all subtests in all modes of instruction achieved mean gains that were statistically significant and met the program criterion for success. Yet there were seven cases in which students did not achieve statistically significant mean gains by grade on a subtest. However, too much importance should not be placed on the failure of these students to achieve statistically significant mean gains: in all of these cases, the number of students taking the subtest was small--17 students or less--and it is more difficult for small groups to achieve mean gains that are statistically significant.

For example, C.A.I. students in first grade did not achieve statistically significant mean gains on the Aural Comprehension

and the Letters and Sounds subtests of the SESAT. On the Aural Comprehension subtest, they achieved a mean gain of 3.9 N.C.E.s and on the Letters and Sounds subtest, their mean score decreased by 8.2 N.C.E.s from pretest to posttest. However, only 13 students took the Aural Comprehension subtest, and only 17 students took the Letters and Sounds subtest. Moreover, C.A.I. students in grade twelve on the Language Mechanics and Language Expression subtests of the CAT (14 students on each test) and face-to-face students in grades ten and twelve on the Language Mechanics subtest and grade ten on the Language Expression subtest of the CAT (13, 10, and 12 students respectively) did not achieve statistically significant mean gains.

RECOMMENDATIONS

The Parent Read-Aloud program was successful in involving parents.

- The Parent Read-Aloud program should be vigorously promoted and expanded.

Staff development training of face-to-face teachers introduced innovative pedagogical techniques. Teachers were satisfied with the training and felt they were successful in implementing the instructional methods presented at workshops.

- Staff development should continue as currently organized.

C.A.I. teachers instruct students at many different grade levels and thus must become familiar with a variety of lesson plans. However, they devoted little time to previewing lessons.

- C.A.I. teachers should receive more training on the content and features of software packages.

Successful implementation of C.A.I. rests in part on the teacher's skill in guiding students through the curriculum.

- C.A.I. trainers should adjust their schedules to accommodate teachers who spend several days per a week away from the administrative center teaching in the face-to-face mode of instruction.

Efforts to adapt software for use in a setting where teachers are not physically present must continue.

- In order to monitor the capacity of the various software systems and companies to adapt to this learning situation, the companies should be evaluated for their responsiveness to teacher suggestions and requests.

Program objectives were generally met by students in the face-to-face mode of instruction.

- Face-to-face classroom instruction should continue as currently organized.

C.A.I. students in the first grade made small or negative mean gains on the Aural Comprehension and the Letters and Sounds subtests of the SESAT.

- The C.A.I. curriculum for first grade should be evaluated and, if necessary, changed.

APPENDIX A

Brief Description of Chapter I Nonpublic School Reimbursable Programs, 1988-89

Chapter I Nonpublic School Reimbursable programs provide supplementary, individualized instruction to students attending nonpublic schools in New York City. Students are eligible for Chapter I services if they live in a targeted attendance area and score below a designated cutoff point on State-mandated standardized reading tests.

On July 1, 1985, the Supreme Court held that instruction by public school teachers on the premises of nonpublic schools--local educational agencies' most common method of serving Chapter I-eligible children--was unconstitutional. As a result, alternative methods for providing Chapter I services to eligible nonpublic school students were devised. Students attending nonpublic schools now receive Chapter I services at mobile instruction units, public school sites, leased neutral sites, and nondenominational schools and via computer-assisted instruction in designated classrooms in nonpublic schools.

CORRECTIVE READING PROGRAM

The Corrective Reading program provides instruction in reading and writing. The goal is to enable students to reach grade level in reading. During 1988-89, the program served 7,943 students in grades one through twelve in 162 nonpublic schools. The total included 3,287 students receiving computer-assisted instruction and 4,656 students receiving face-to-face instruction. Program staff included one coordinator, three field supervisors, and 80 Corrective Reading teachers. Instruction was provided to small groups of students, one to five days a week, in sessions lasting 20 to 60 minutes. Chapter I funding totaled $7.8 million.

READING SKILLS CENTER PROGRAM

The Reading Skills Center program provides instruction in reading and writing to students in grades four through eight. The goal is to enable students to reach grade level in reading. During 1988-89, the program served 176 students from four nonpublic schools. Program staff included a coordinator and seven teachers. Instruction was provided to small groups of about five students, three to five days per week, for sessions lasting from 45 to 60 minutes. Chapter I funding totaled $740,000.

CORRECTIVE MATHEMATICS PROGRAM

The Corrective Mathematics program provided instruction in mathematics. The goals are to deepen students' understanding of mathematical concepts and to improve their ability to perform computations and solve problems. During 1988-89, the program served 5,806 students attending 130 nonpublic schools. The total included 3,689 students receiving face-to-face instruction and 2,117 students receiving computer-assisted instruction. Program staff included a coordinator, two field supervisors, and 70 Corrective Mathematics program teachers. Instruction was provided to small groups of students, one to five days per week, in sessions ranging from 45 to 60 minutes. Chapter I funding totaled more than $4.7 million.

ENGLISH AS A SECOND LANGUAGE

The English as a Second Language program provides intensive English language instruction to limited English proficient students. The goal of the program is to help students gain the listening, speaking, reading, and writing skills necessary to improve their performance in school. During 1988-89, the program served 2,445 students in kindergarten through eighth grade in 69 nonpublic schools. Two thousand and twelve of these students received face-to-face instruction, and 433 of them computer-assisted instruction. In addition, a Read-Along component provided some students with tape recorders, storybooks, and audio tapes for home use. Program staff included a coordinator, two field supervisors, and 42 teachers. Instruction was provided to small groups of students two to three days a week in sessions ranging from 30 to 60 minutes. Chapter I funding totaled $2.4 million.

CLINICAL AND GUIDANCE PROGRAM

The Clinical and Guidance program provides diagnostic and counseling services to students enrolled in Chapter I nonpublic school programs--Corrective Reading, Reading Skills Center, Corrective Mathematics, and English as a Second Language. The goal of the program is to alleviate emotional or social problems that interfere with the students' ability to profit from remedial education. During 1988-89, the program served 5,707 students from 123 nonpublic schools. The staff included two coordinators, two field supervisors, 58 guidance counselors, 36 psychologists, one psychiatrist, and 12 social workers. Chapter I funding totaled $5.7 million.

APPENDIX B

OFFICE OF RESEARCH, EVALUATION, AND ASSESSMENT
INSTRUCTIONAL SUPPORT EVALUATION UNIT
E.C.I.A. - Chapter 1, NPS, C.A.I. 1988-89

TEACHER QUESTIONNAIRE

Computer Program _____

Subject (check one):
Corrective Mathematics____
Corrective Reading ____
ESL ____

I. Background Information
A. Teacher Experience
1. Years of Chapter 1 teaching experience_____
2. When did your very first C.A.I. class go on-line? Month _____ Year ____
3. Did you have previous C.A.I. experience (prior to the 1986-87 school year)?____Yes ____No
a) If yes, specify:_____

_____

4. Did you have previous experience with computers?____Yes____No
a) If yes, specify_____

_____

B. Students Served
1. Please check off/fill out whatever applies to you.

a)____CAI Only ____days per week _____ minutes per day

b)____Combination Services: <u>CAI</u>:____days per week ____minutes per day <u>Face-to-Face</u>:____days per week ____minutes per day

c)____Non-C.A.I., Face-to-face only_____days per week _____minutes per day

2. Please list the number of C.A.I. students (including combination services)for whom you are responsible:

Grades: K____ 1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____ 11____ 12____

3. Please list the number of non-C.A.I., face-to-face only students for whom you are responsible:

Grades: K____ 3____ 6____ 9____ 12____
1____ 4____ 7____ 10____
2____ 5____ 8____ 11____

4. How many schools do you work with in each of the following categories: C.A.I. only _____
Combination services_____
Face-to-face only_____

II Communication with C.A.I. Schools

A. Communication with NPS Principals and classroom teachers

What C.A.I. reports do you provide, and how often do you provide them, to principals and classroom teachers?

Reports	Provided to:	How Often?
_____	_____	_____
_____	_____	_____
_____	_____	_____

B. Communication with Non-Instructional Technicians

1. With how many Non-instructional technicians do you work?_____

2. How often do you speak to them?_____

3. Describe the purpose, (purposes) of a typical communication(s):

_____

_____

_____

_____

C. Communication with Students

1. What percentage of your communications with students are:

By Telephone _____ %
By Computer Mail _____ %
Face-to-Face _____ %
_____ 100%

2. On the average, with how many students do you communicate each week? _____

D. How can your communication with students and non-instructional technicians at C.A.I. sites be improved?_____

_____

_____

_____

III Perceptions of Software

A. Usefulness of reports

1. Are software-generated reports adequate for tracking student progress? _____Yes ____No

a) Is there any information about student progress which you would like added to the reports? _____

_____

_____

2. Are principals satisfied with the reports?____Yes ____ No

a) What is the most frequently asked question from a principal about a report? _____

_____

_____

B. Lesson Contents

1. Approximately what percentage of the C.A.I. lessons covered by your students have you had a chance to preview?_____

a) Approximately what percentage of your time do you use for previewing lessons?_____

2. Please rate the following software features:

	Excellent	Good	Fair	Poor
a) Factual accuracy	____	____	____	____
b) Appropriateness of lessons to program's educational objectives	____	____	____	____
c) Correlation of lesson contents with subject area's curriculum objectives	____	____	____	____
d) A developmentally logical approach to the sequencing of material	____	____	____	____
e) Explanations provided as				

a result of errors				
f) Maintains student interest and motivation	____	____	____	____
g) Explanation of concepts and principles	____	____	____	____
h) Enhances problem solving and critical thinking ability	____	____	____	____
i) Graphics component	____	____	____	____
j) Audio component	____	____	____	____
k) Pacing of lessons	____	____	____	____
l) Reinforcement of concepts and skills	____	____	____	____
m) Reviews of lesson content	____	____	____	____

3. Does the software provide an initial placement test?___Yes___No
   a) If yes, have you used it?____Yes ____No
   b) If no, how did you place your students in the software curriculum? _____

_____

_____

_____

4. How often, on the average, do you have to adjust the difficulty level of the software? _____ Weekly
   _____ Bi-Monthly
   _____ Monthly
   _____ Less Often

5. How responsive is the software company to your requests and suggestions?
   ____Very ____Moderately ____Somewhat ____Not at all

6. What suggestions do you have for the improvement of lesson contents?

_____

_____

_____

_____

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_____

IV. Combination Services Information

A. How do you utilize your face-to-face instructional time?

B. How do your C.A.I. teaching techniques and curriculum content differ from non C.A.I.?

C. Describe the quality and frequency of the feedback you receive regarding your students' computer-based learning.